

Oceanography Seminar

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"A time for every season: Seasonal cycles of plankton from gappy data"

Nearly all marine ecosystems are modulated seasonally. This is particularly evident in primary producers of boreal and temperate environments, where the cycle of feast and famine imprints itself throughout the marine food web, from the pelagic to the benthos, from phytoplankton to zooplankton, fish, marine mammals and birds, and also to microbial processes, pathogens and parasites. How organisms organize their life histories and annual routines to best survive and make use of seasonal cycles is a fundamental evolutionary pressure on life in much of the world's oceans.

In many parts of the world's oceans, marine primary production displays a distinct seasonality, especially during the spring bloom. These fluctuations can be measured either in situ or from space. During the last decades, a significant amount of studies on phytoplankton have used satellite derived ocean colour as a useful tool to study various processes in the world's oceans. Satellite data provide snapshots of how much chlorophyll is produced in the ocean. Using the satellite derived products to detect blooms has, however, a down side. Multiple processes can impact the quality of timing estimates, such as cloudy weather or low seasonal variations in productivity. A good estimate of the timing of phytoplankton blooms should take into account all these processes. Moreover, the choice of a good timing metric should be determined by the research question being addressed.

In this talk, I will focus on how satellite derived products are affected by multiple processes that impact the robustness of phenology estimates, such as 1) processes related to the observation methods that cannot be controlled by the experimenter (missing data, the presence of observational noise and the amplitude of the underlying signal relative to the noise); and 2) processes that are associated with the analysis methods and can be controlled (temporal resolution, pre-processing technique and phenology metric). I will show results both from the North Atlantic and the North Pacific.

Thursday March 9th, 2017 3:00 p.m. MSB 100